

REMARKS

Claims 1-8 are pending in this application. By this Amendment, claims 1, 3-5 and 7 are amended. No new matter is added. In view of the above amendments and the following remarks, Applicant requests the favorable consideration of claims 1, 3-5 and 7.

Claims 1 and 2 were rejected under 35 U.S.C. 102(b) as being anticipated by Quinn R. 31,545. The Examiner maintains his position in the Advisory Action dated June 25, 2003. Specifically, the Examiner states that the voltage sources are considered ground for small signal analysis, therefore, the amplifiers 100 and 102 as illustrated in Quinn are grounded emitter amplifiers. Applicant respectfully disagrees.

In the previous Office Actions, the Examiner took the position that in small signal analysis the grounded base amplifiers (78,80) of Quinn are AC grounded. In addition, even if the emitters of a pair of transistors (100, 102) of Quinn are grounded in small signal analysis, the transistors (100, 102) operate differently than the grounded emitter amplifiers of the claimed invention. For instance, when a relatively large input signal to one of the transistors, the maximum currents of the transistors are determined by a current source (105). In other words, a current more than the current determined by the current source (105) does not flow in the transistors (100, 102). Therefore, when a relatively large input signal is applied to one of the amplifiers (100, 102), it is not possible to obtain a large output signal corresponding to the large input signal, which makes it unable to improve the linearity of the output signal. Also, the lack of linearity of the output signal makes it unable to improve the balance of differential output signals even if the outputs of the transistors (100, 102) and the outputs of the transistors (78,80) are cross-coupled.

In contrast, in the claimed invention, a current flowing in one of the amplifiers

increases as an input voltage increases and is not limited to a predetermined current as determined by the current source (105) of Quinn. Thus, in the present invention, when a relatively large input signal is applied to one of the grounded emitter amplifiers, a base biased voltage (bias point or operational point) increases due to the large input signal, thereby increasing the current flowing the amplifier. Accordingly, even if an idle current, which is based on a biased voltage is relatively small, the current increases due to a self-biasing effect when a large input signal is applied, thereby obtaining a large output signal. That is, employing the grounded emitter amplifiers improves the linearity of the output signal .

In addition, Quinn does not teach or suggest using a single-end differential converter that includes grounded emitter amplifiers with a single-end configuration in which two single-end amplifiers operate by differential inputs. Also, Quinn does not teach or suggest that each grounded emitter amplifier includes a resistor connected between an emitter of a transistor and a ground. Therefore, it is submitted that Quinn neither teaches nor suggests all the features recited in claim 1.

Claim 7 was rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (APA) in view of Quinn. Applicant respectfully traverses this rejection.

It is submitted that the combination of the applied references neither teach nor suggest all the features recited in claim 7. It is apparent from the above analysis, the applied references fail to teach or suggest the grounded emitter amplifiers as claimed in the present invention. Therefore, Applicant requests the withdrawal of the rejection of claim 7 under 35 U.S.C. 103(a).

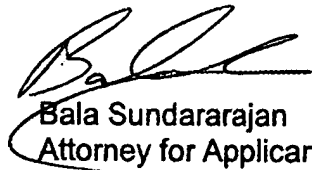
In view of the above amendments and distinctions discussed above, Applicant

requests the withdrawal of the rejection of claims 1, 2, and 7. Claims 1, 3-5, and 7 are amended. No new matter is added. Therefore, Applicant submits that the application is now in condition for allowance with claims 1-8 contained therein.

Please charge any fee deficiency or credit any overpayment to Deposit Account No. 01-2300.

Respectfully submitted,

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Enclosure: Petition for Extension of Time